

University of Groningen

fMTP

Salet, Josh; Kruijne, Wouter; Rijn, van, Hedderik

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Publication date:
2019

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Salet, J., Kruijne, W., & Rijn, van, H. (2019). *fMTP: A Unifying Computational Framework of Temporal Preparation Across Time Scales*.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

fMTP: A Unifying Computational Framework of Temporal Preparation Across Time Scales

Josh M. Salet^{1*}, Wouter Kruijne¹, Sander A. Los²
Hedderik van Rijn¹, Martijn Meeter²



¹University of Groningen
²Vrije Universiteit Amsterdam

*j.m.salet@rug.nl

The Story

Temporal preparation is modulated across a **vast range of time scales**

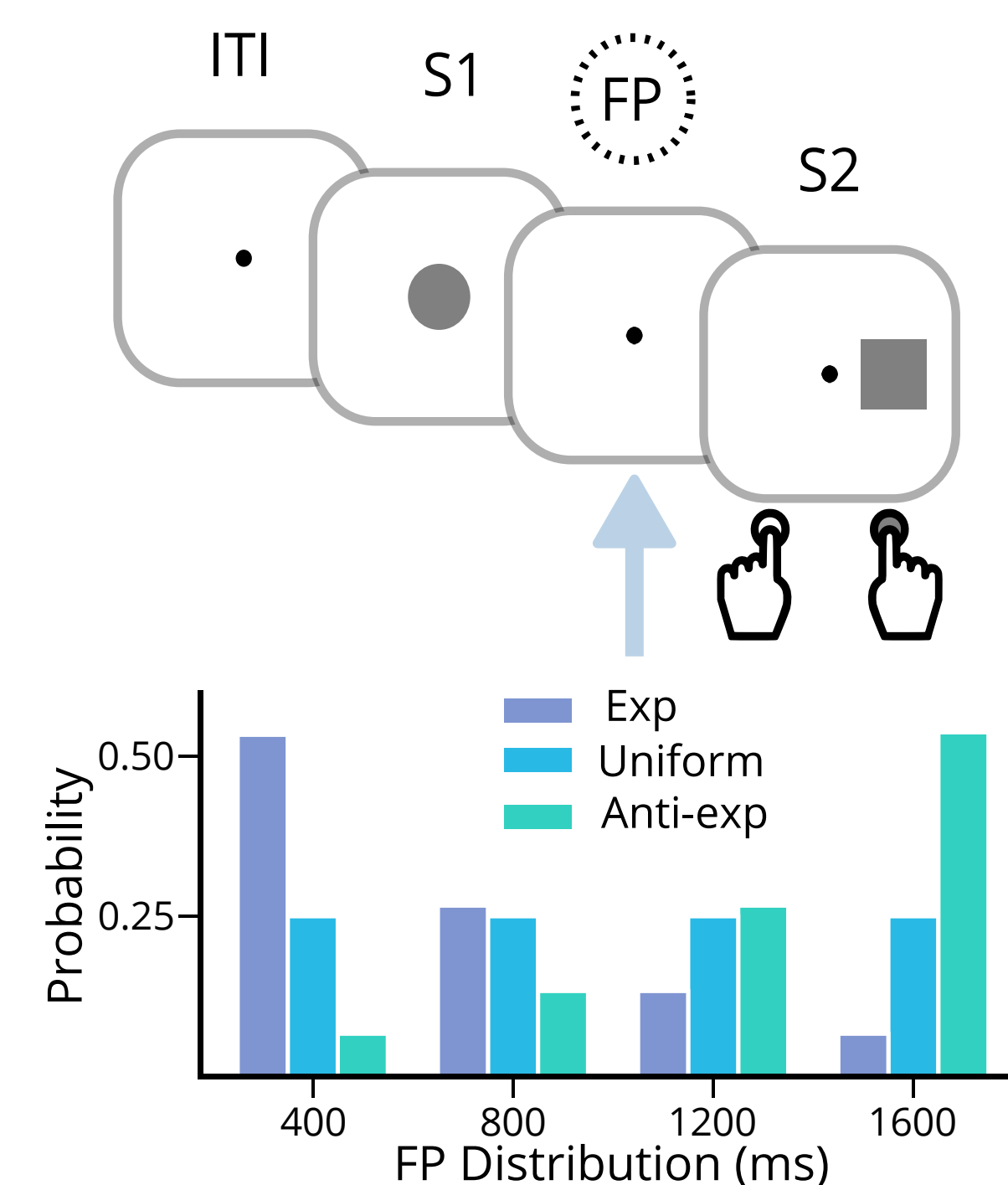
What is the unifying mechanism giving rise to these phenomena?

We pursue the view that these phenomena are driven by **implicitly learned processes**

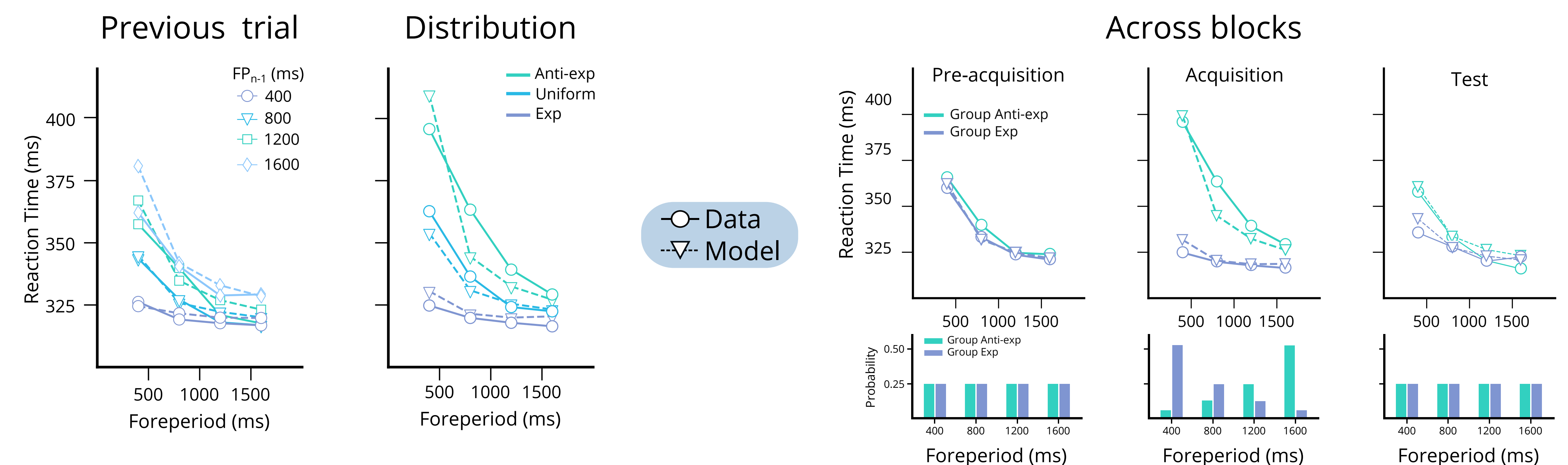
fMTP integrates insights on the **coding of time, episodic memory, and motor planning**

Simulations demonstrate that **fMTP captures all phenomena**

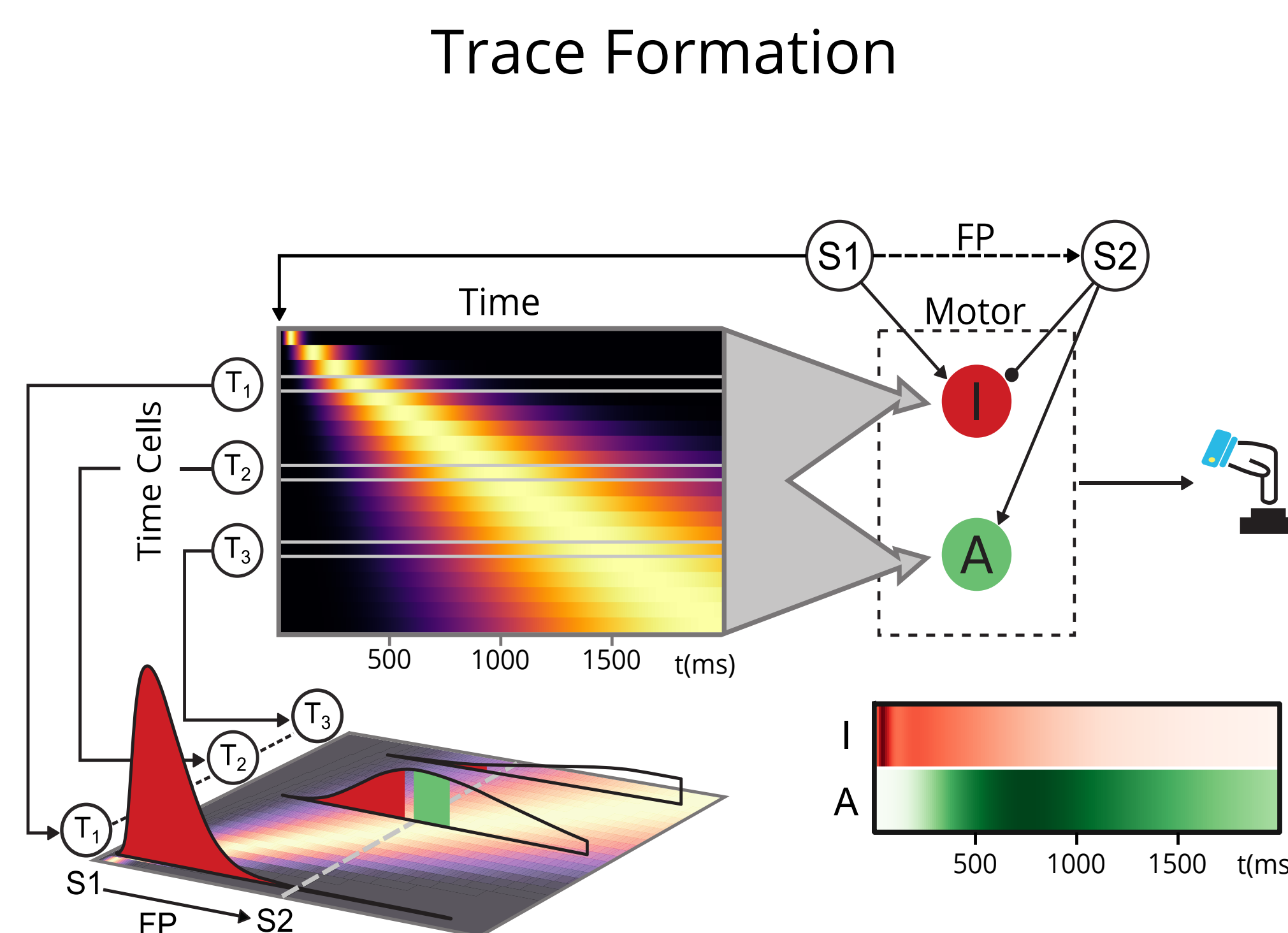
FP Paradigm



FP Effects

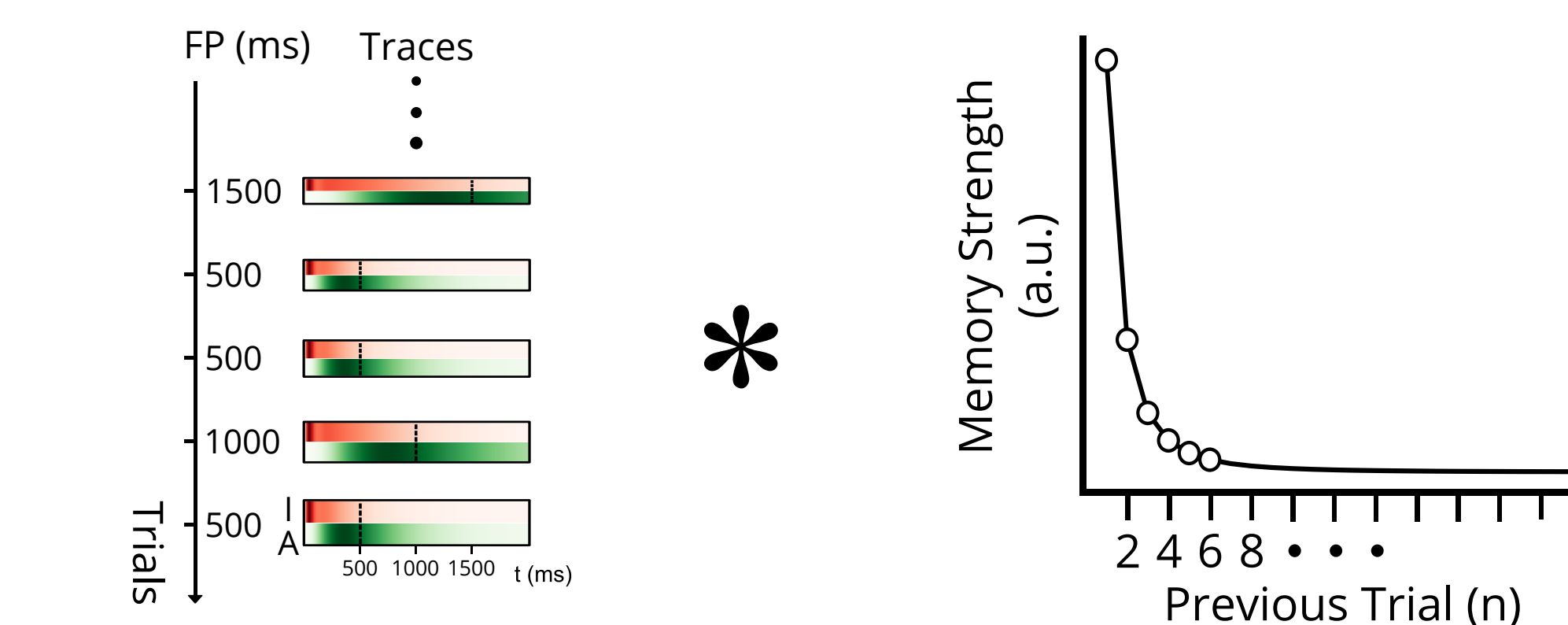


fMTP's Dynamics



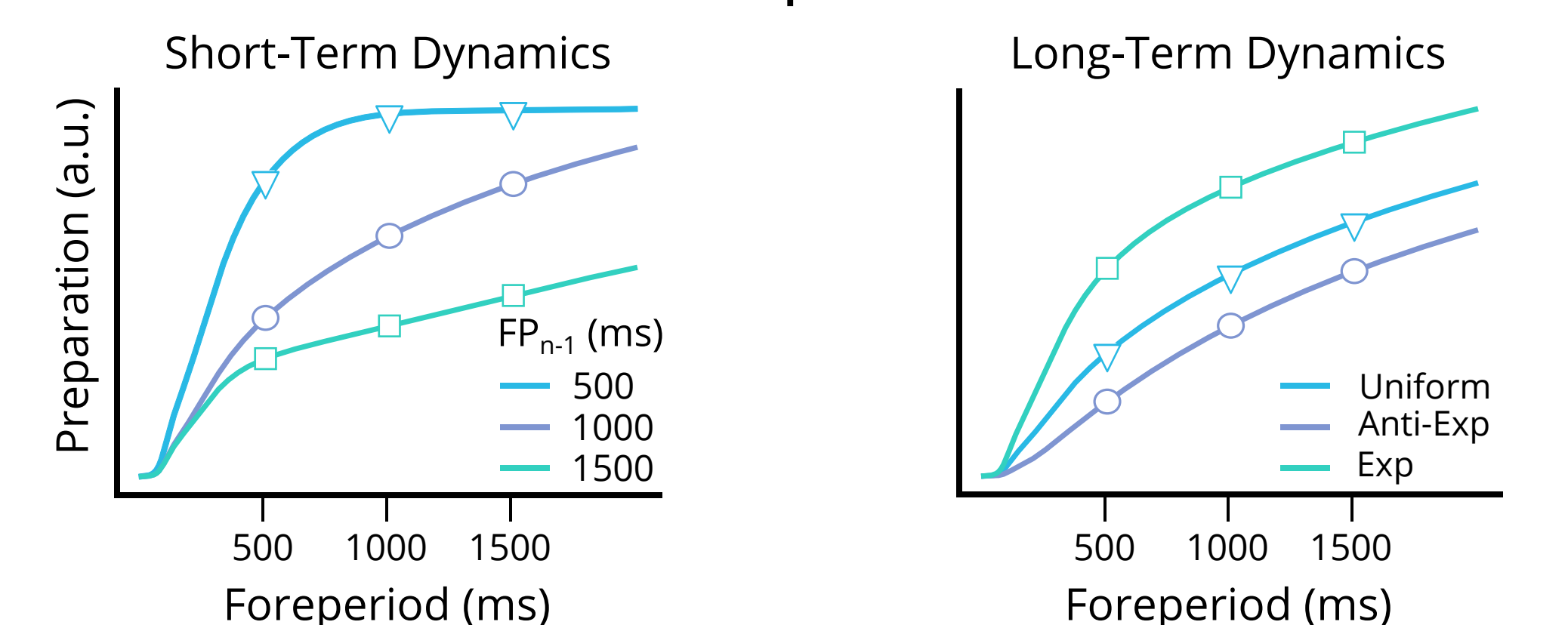
The core of fMTP is an implicit associative learning process between time cells and activation- and inhibition motor units

Trace Retrieval



Previous experiences drive preparation according to their recency

Trace Expression



Strong influence of recent trials gives rise to short-term dynamics

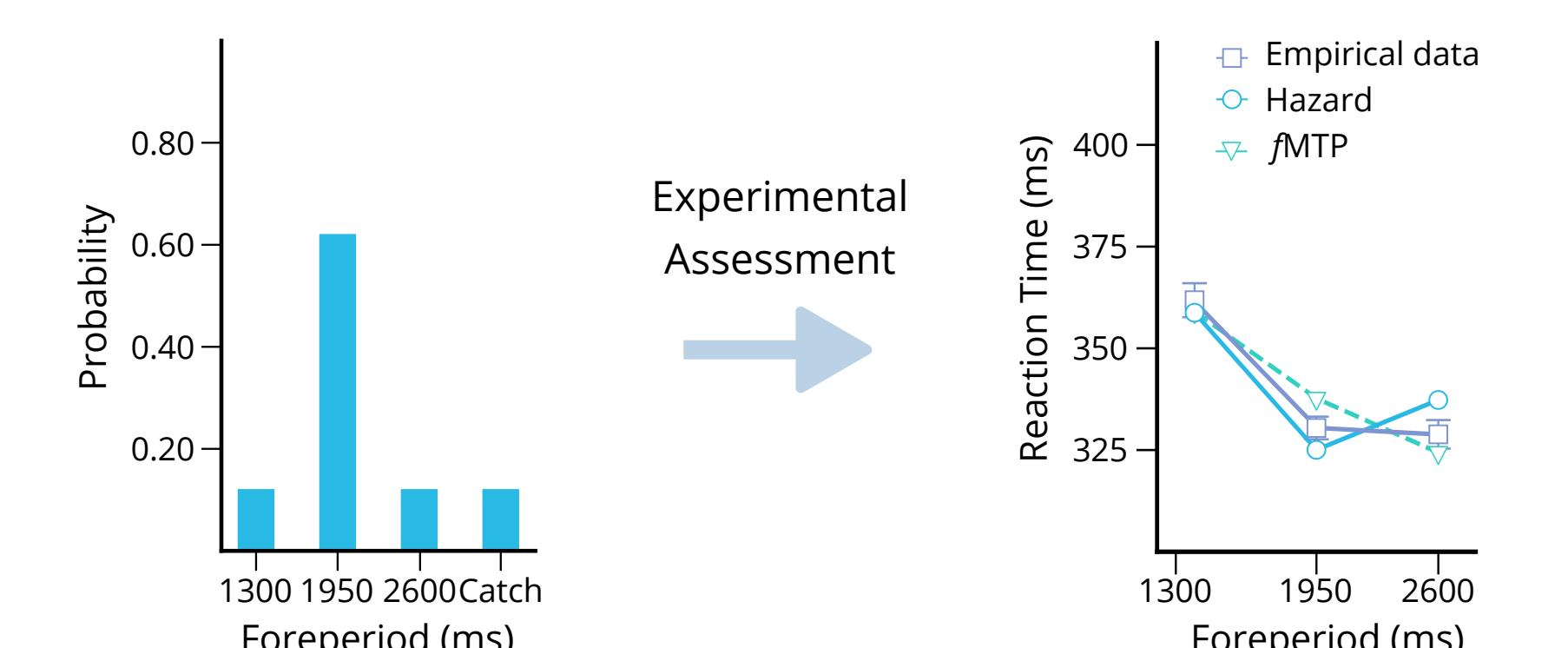
Long-lasting influence of each trial gives rise to long-term dynamics

fMTP vs Hazard

Hazard accounts: Preparation is controlled by a process that follows the conditional probability

	Previous trial	Distribution	Across Blocks
fMTP	✓	✓	✓
Hazard Function	✗	?	✗

fMTP and the Hazard function make different predictions regarding the Gaussian FP distribution



We show the data to be consistent with fMTP and to deviate from the Hazard function